

09/064057

## Compositions and Methods for Reverse Transcription of Nucleic Acid Molecules

### ABSTRACT

5 The present invention is generally related to compositions and methods for  
the reverse transcription of nucleic acid molecules, especially messenger RNA  
molecules. Specifically, the invention relates to compositions comprising mixtures  
of polypeptides having reverse transcriptase (RT) activity, and to methods of  
producing, amplifying or sequencing nucleic acid molecules (particularly cDNA  
10 molecules) using these compositions or polypeptides, particularly at temperatures  
above about 55°C. The invention also relates to nucleic acid molecules produced  
by these methods, to vectors and host cells comprising these nucleic acid  
molecules, and to the use of such nucleic acid molecules to produce desired  
polypeptides. The invention also relates to methods for producing Rous Sarcoma  
15 Virus (RSV) and Avian Myeloblastosis Virus (AMV) RTs or other Avian  
Sarcoma-Leukosis Virus (ASLV) RTs ( $\alpha$  and/or  $\beta$  subunits thereof), to isolated  
nucleic acid molecules encoding such RSV RT, AMV RT or other ASLV RT  
subunits, to vectors and host cells comprising these isolated nucleic acid molecules  
and to RSV RT, AMV RT and other ASLV RT subunits produced by these  
20 methods. The invention further relates to nucleic acid molecules encoding  
recombinant heterodimeric RT holoenzymes, particularly heterodimeric RSV RTs,  
AMV RTs or other ASLV RTs (which may be  $\alpha\beta$  RTs,  $\beta\beta$  RTs, or  $\alpha$  RTs),  
vectors (particularly baculovirus vectors) and host cells (particularly insect and  
yeast cells) comprising these nucleic acid molecules, methods for producing these  
heterodimeric RTs and heterodimeric RTs produced by these methods. The  
25 invention also relates to kits comprising the compositions, polypeptides, or RSV  
RTs, AMV RTs or other ASLV RTs of the invention.